

DOCUMENT RESUME

ED 180 438

IR 007 905

AUTHOR Cawkell, A. F.
 TITLE Viewdata, Prestel, Teletext: Home TV and Scitel Science Magazine.
 PUB DATE 78
 NOTE 15p.
 EDRS PRICE MF01/PC01 Plus Postage.
 DESCRIPTORS Computer Oriented Programs; Computer Programs; Display Systems: *Information Processing; *Information Services: Information Storage; *Information Systems: Screens (Displays): Technological Advancement: *Video Equipment
 IDENTIFIERS Great Britain: *Microprocessors

ABSTRACT

This paper describes the development of textual information displays for home consumption on modified television receivers in Great Britain over the last few years, compares two systems in use there--Teletext and Viewdata--and discusses some future possibilities for such services in the U.S. as well as the U.K. British television equipment manufacturers are actively considering the connection of home computers to receivers which contain microprocessors to provide the reception of computer programs broadcast via the Teletext and Viewdata systems. A program, stored for as long as it may be needed in the receiver's existing page storage, is executed by the microprocessor, and the TV screen is used for display. Such an arrangement would enable a viewer to run-in whatever program he/she needs. Concurrently, the full power of access to very large information files via Prestel telephone service would be available to the viewer using the same all-purpose terminal.
 (Author/CMV)

 * Reproductions supplied by EDRS are the best that can be made *
 * from the original document. *

ED180438

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

VIEWDATA, PRESTEL, TELETEXT:

HOME TV AND SCITEL SCIENCE MAGAZINE

by

A. E. Cawkell

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

A. E. Cawkell

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

IR007905

Introduction

"A Memex is a desk comprising translucent screens on which may be projected book pages, records, photographs, memoranda, all sorts of things; associative indexing enables any item to be caused at will to select another immediately and automatically."

Vannevar Bush
"As we may think"
The Atlantic Monthly, 1945.

"So it can be done. Will it be done? Ah that is another question ... A long time from now, I fear, will come the personal machine. It will be delayed in coming principally by costs, and we know that costs will go down, how much and how rapidly none can tell."

Vannevar Bush
"Memex Revisited"
Science is Not Enough
(Apollo, NY 1969)

The above quotations, by an eminent American, convey both hope and uncertainty - note particularly the uncertainty about costs. Today we can be rather sure that a machine something like the one in Bush's vision will soon be available at a reasonable cost. Surely, you will say, the inexpensive personal computer is here now? Indeed it is, but at least three ingredients of the Memex are missing. First, large files of information cannot yet be cheaply stored on a home computer. Second, information has to be indexed in some way if we are to find quickly what we need - and that is an intellectual task which remains a problem. Third, cathode ray tube screens are too small; the eye/brain can easily scan and

select from, say, a newspaper page containing 30,000 characters, whereas the best CRT can manage about 2,500 without room for graphics. A television receiver can manage about 1,000.

Some of these difficulties are being solved in a way which Bush could hardly have anticipated. I am referring to a potential pseudo-Memex in most people's homes - a television receiver, plus a dial telephone, plus a home computer; although this paper is about Viewdata/Prestel the future interdependence of these three devices must be taken into consideration, and I will discuss them later.

Equipment Developments

In Britain, textual information displays for home consumption on modified television receivers have been developed over the last few years in the following ways.

In 1972 the British Broadcasting Corporation (BBC), the Independent Television Authority, the TV receiver manufacturers and the British Post Office jointly discussed a standard for the transmission and format of pages of text to be displayed on a modified colour TV receiver. Transmission would be digital - that is characters would be transmitted as codes of on-off pulses or "bits". After decoding, one page of 24 rows of 40 characters would be stored and continuously displayed on the receiver. Provision would also be made for the display of graphics, built up as a pattern of stored picture elements.

The receiver would be a standard colour television set modified by the addition of decoding, control, and storage modules formed from integrated circuit elements. The transmitted data would contain information about the position and row of each character on a page or the position of graphic elements, the colour in which a character could be displayed, and various other enhancements such as flashing or special characters. This standard was adopted so that organisations intending to transmit information and receiver manufacturers could enjoy a period of technical stability.

Development of systems then proceeded along two paths. The first system was called Teletext, and the Ceefax and Oracle television services, using this system, are now operated by the BBC and Independent Television Authority (ITA) respectively.

In Britain, television entertainment fields are transmitted 50 times per second, and Teletext codes are included as bursts of data fitted into a small unoccupied part of each

field. It takes about 1/4 second to transmit one page of text, and a sequence of 100 pages is transmitted every 25 secs. A viewer sets a page number on a dial on the receiver and then waits 12.5 secs. on average until the wanted page is captured the next time it is transmitted.

A typical page from these Teletext services, photographed from a receiver*, is shown in Figure 1. Both Ceefax and Oracle are now operating in Britain on a regular basis.

Oracle p 253 Mon 05 Jan 19.07/18							
<u>ITN SPORTS NEWS</u>							
Scottish League - Division Two							
Top Four:	P	W	D	L	F	A	PTS
Clydebank	20	13	4	3	35	9	30
Raith	19	10	9	0	35	19	29
Bottom Four:							
Brechin	17	5	4	8	23	27	14
Stenh'smuir	19	4	4	11	22	35	12
Forfar	19	3	6	10	19	34	12
Meadowbank	20	3	5	12	12	44	11
League Division One follows shortly							

Fig. 1

Meanwhile the second system for text display, named Viewdata, was being developed by the British Post Office. A service called Prestel is running experimentally in Britain using this system; it is rather different from Ceefax and Oracle. The same modified television receiver, codes, and storage are used, but the receiver is connected to the viewer's telephone line and receives information by this route instead of via the TV antenna. Additionally the viewer holds a small keypad associated with the TV receiver embodying buttons marked 0 to 9, two control buttons, and an auto-dialing button; with this device command signals for particular pages may be sent along the same telephone line. The heart of the system is a local computer which may be dialed by a viewer; the machine now operating from the London area can handle 100 calls simultaneously, but will soon be able to handle several

*In Mr. Cawkell's presentation, colored slides showed pages photographed from the TV screen; typed representations are used here.

hundred. Similar machines will be installed in other parts of the capital and in other cities during 1979. Upon receipt of a command from a viewer, the computer retrieves page data from storage and transmits it down the line to be displayed on the TV receiver.

There are three basic differences between Viewdata and Teletext. First, the viewer can select a Viewdata page, then proceed to a second page in an interactive manner, in contrast to the more passive selection procedure on Teletext. Second, a dedicated channel - the telephone line - is available for sending and receiving information; an ordinary switched telephone line has the capacity to transmit text codes with virtually no delays, in contrast to the Teletext system. Third, the number of pages available is limited only by economic and computer storage considerations. This is expected to be several hundred thousand per computer, with perhaps a larger number available from bigger machines networked into the system. As of December 31, 1978, about 100,000 pages are stored in the London Viewdata/Prestel machine.

The source of information in Teletext is the BBC and ITA. On Viewdata/Prestel any organisation can provide a service by arrangement with the Post Office. Currently about 150 different organisations have services operating at various stages of development. The kinds of service which are becoming available are shown in Figure 2. It will be obvious that if only about one hundred pages are available on Teletext, then they can be indexed rather easily. For instance, a particular page can be set aside for a subject index to other pages. For the larger number of pages on Viewdata a special index has been devised rather like the branches of a tree. The viewer is first presented with ten general choices of subjects numbered 0 to 9; upon pressing the appropriate button on the keypad ten numbered sub-divisions of the chosen subject are presented, and so on, until the information page is displayed. It will be obvious that 1 out of 100,000 pages could be chosen by 5 successive "choose 1-out-of-10" commands. If, however, the viewer already knows the number of a wanted information page he can send a direct command for it.

VIEWDATA/PRESTEL

Some of the services -

News	House & Mortgages
Sport	Going Out
Radio & TV	Facts & Figures
Holidays & Travel	Money & Insurance
Tourist Guide	Jobs & Careers
Education	Business Services
Hobbies & Pastimes	Messages
Jokes, Quizzes, Games	Science & Technology News
Home & Family	Cars & Motoring
Marketplace	

Fig. 2

Scitel Services

The way Prestel works in terms of one of its component services - Scitel - is shown in Figures 3 - 12. Figure 3 shows Prestel's very first page.

Prestel	1791a	0.5p
INFORMATION NOW ON PRESTEL		
1	BUSINESS $\frac{1}{2}$ p	Shares, money, companies
2	SPORT & HOBBIES $\frac{1}{2}$ p	Taking part, recds
3	ENTERTAINMENT $\frac{1}{2}$ p	Places to visit, jokes, quizzes, eating out, theatre
4	HOLIDAYS, TRANSPORT, TRAVEL $\frac{1}{2}$ p	Hotels, package tours, air, sea, rail, motoring
5	MARKETPLACE $\frac{1}{2}$ p	For sale, consumer aid
6	ADVICE $\frac{1}{2}$ p	Medical, educational, money, safety, buying advice, legal
7	GOVERNMENT INFORMATION $\frac{1}{2}$ p	
8	EMPLOYMENT $\frac{1}{2}$ p	jobs, careers, law
9	BOOKS & REFERENCE $\frac{1}{2}$ p	facts, reviews
0	OTHER $\frac{1}{2}$ p	Science, weather, charities, horoscopes
PRESTEL tm		

Fig. 3

7 dec

If button '0' is selected the choices shown in Figure 4 are presented.

Prestel	17910a	0.5p
OTHER INFORMATION		
1 SCIENCE 0.5p		
2 WEATHER 0.5p		
3 HOROSCOPES 0.5p		
4 GIVING TO CHARITY 0.5p		
5 PARLIAMENT 0.5p		
PRESTEL tm		

Fig. 4

After two more selections along the science route the first page of Scitel appears. The page shown in Figure 5 then follows. Each page always ends with a prompt - usually either a 'continue' instruction (the "#" - one of two special buttons on the keypad) or a "key page number" instruction.

isi scitel (tm)	555a	0.2p
isi SCITEL SERVICES		
SCITEL services of the Institute for Scientific Information (ISI) are mounting the science news service for Viewdata.		
Apart from the special feature, pages will be updated daily or weekly.		
Remember you can obtain SCITEL directly by keying *555#. Please send in your comments, criticisms, or suggestions to ISI Research Dept., 132 High Street, Uxbridge, Middx. UB8 1DP. Uxbridge 56710		
For information headings - Key #		

Fig. 5

Next comes the Scitel index page (Figure 6), and it seems appropriate at this point to discuss the content and purpose of this service in the context of the total Prestel services.

E. A. C.

Prestel is currently running experimentally with up to 1500 receivers - half in businesses and half in households - installed by the Post Office for market research purposes. This phase will merge into a public service to be inaugurated in various parts of the country during 1979. The business of the Institute for Scientific Information (ISI) is self-evident, and when thinking about getting into this new media we had to consider what information we were able to supply and the interests and size of the developing audience. We chose to experiment with a science magazine - modest but capable of being easily expanded. The service is aimed at informed laymen and it attempts to provide an overview of current science. To this end subject coverage and topicality have received careful attention. Areas of science are grouped as shown in Figure 6: we obtain our information from press releases, foreign embassy communiques, government departments, research establishments, scientific journals, newspapers, and so on. The information is selected, edited, and highly compressed for input to the Prestel computer on-line from a terminal in our research offices at Uxbridge. Information can be input immediately at any time of day - a small fraction of what we receive demands immediate treatment. Other material - such as book reviews - can be handled in a more leisurely manner. Some information becomes rapidly out of date and is quickly replaced; other items may endure for several weeks. At present we have about 200 pages in central storage, and the rate of change is about 50 pages per week.

isi scitel (tm)	555c	0.2p
isi SCITEL		
0 Science News in Brief 1 Natural Resources and Environmental News 2 Advances in Science 3 Science Books 4 Science - Special Feature 5 New Technology & the Computer & Information Revolution 6 ISI News & Information 7 Medicine & Health 8 Energy		
Key the required number. Items generally indicate source of information. If you need the source & have difficulty in obtaining it, ask ISI about Original Article Tear Sheet (OATS) service. For ISI address Key 9		

Fig. 6

Continuing from Figure 6 - the index page - examples of information pages are shown in Figures 7 through 12. Note the facility for cross-referencing to a more detailed exposition from a terse announcement by a single button prompt. This technique may be used to fetch any page from the entire Pres-tel database.

```
isi scitel (tm)          55500b    0.2p
SCIENCE NEWS HEADLINES

Theme for the annual meeting of the American
Association for the Advancement of Science,
Houston, Texas, Jan 3-8, 1979, will be Science
& Technology: resources for our future
    For more - Key 4

Exploration of mud from bottom of Red Sea
indicates presence of silver, zinc and
other metals in workable quantities
    For more - Key 5

Dental care surgeries are being set up in
stores in California. Retail dentistry "is
the coming thing" says the Los Angeles Times
quoted in The Guardian, 19.12.78.
    For more News Headlines - Key #
```

Fig. 7

```
isi scitel (tm)          55504a    0.2p
SCIENCE NEWS: POLICY

AAAS Meeting, Houston, Jan 3-8, 1979
Science & Technology - resources for
our future

This large meeting will comprise public
lectures, a science film pictorial, and a
symposium. Amongst the subjects will be -

* Ecology & the Environment
* Social Sciences & the family
* Education
* Energy
* Engineering
* Science Policy
* Agriculture & Nutrition

The technology and .....
    To continue - Key #
```

Fig. 8

isi scitel (tm) 55504b 0.2p

POLICY (CONTINUED)

AAAS Meeting

... consequences of the rapidly expanding field of information & communication (including Prestel/Viewdata) will also be discussed.

The public lectures include such topics as -

- Space exploration
- Understanding arterio-sclerosis
- The seasons of men

For more Policy News - Key #

Fig. 9

isi scitel (tm) 5552a 0.2p

ADVANCES IN SCIENCE

- 0 Life Sciences
- 1 Physical Sciences
- 2 Social Sciences

Key the required number

Fig. 10

isi scitel (tm) 55522c 0.2p

ADVANCES IN SCIENCE: SOCIAL STUDIES

U. S. population will peak by 2015

Population of the US is growing much more slowly than was forecast only a few years ago, and is likely to peak at 253m in 2015.

This is well below the forecast of 300m by the year 2000 that had been widely used until fairly recently. The population of the US is currently estimated to be about 220m.

Relevant factors are a diminishing number of women who marry and the postponement of marriage to a later age. In 1960, for example.....

To continue - Key #

Fig. 11

isi scitel (tm) 55522d 0.2p

SOCIAL SCIENCES (CONTINUED)

.... about 71% of women between the ages of 20 and 24 were already married. By 1978, the proportion had dropped to 52%. The longer childbearing is postponed, the fewer fertile years a woman has remaining.

The decline is not new. The birth rate has been coming down for the past 200 years in the US - with the exception of one period. The real question, and the more perplexing one, is what caused the exception - the baby boom that lasted for more than a decade after World War II..

NY Times 3.12.78.

For more Social Sciences - Key #

Fig. 12

We do not know how our new public will take to Prestel or to Scitel in particular. We do know that the average rate of page consumption is about four per minute; this will cost a viewer about 3p or 6 cents in telephone time and Post Office service charges; additionally each information provider will levy his own per page charge, with the Post Office collecting and distributing the revenues. In some cases pages will be free - for instance with holiday tour information or cars for sale, revenue will be received from advertisers. Assuming that the total cost is 5p or 10 cents for 4 pages per minute, a viewer could participate in about five 16-page sessions five times a week for about £50 or \$100 a year - the price of a good quality daily newspaper. The modified television receivers are expected to cost about £50 or \$100 more than standard receivers when they are in mass production.

Future Possibilities

It is interesting to speculate about the probability of take-off for an innovation of this kind. In Figure 13 two scenarios are compared; technological success is only one of several necessary ingredients. The optimistic predictions made for U.S. interactive Cable TV in 1969 and 1970 were not fulfilled for the reasons shown. The conditions for Viewdata/Prestel in the U.K. appear to be more favorable.

INNOVATION CONDITIONS

U.S.	<u>Interactive Cable TV</u> Content dilemmas No standardisation Cost of entry FCC regulations RESULT - NO TAKEOFF
U.K.	<u>Viewdata</u> Monopolies/quick standardisation Current technology Cheap revenue collection All-purpose terminal Simple indexing/cheap computer Content right? RESULT - TAKEOFF?

Fig. 13

Developments for similar services are in hand in a number of countries. In the U.S., Insac of New York, on behalf of the U.K. National Enterprise board, is considering implementation using the Post Office software with variations. They envisage terminals costing about \$500 and computer connect time at around \$1 per hour. Insac believe that the combination of the GEC (not to be confused with GE) highly economic minicomputer together with the Post Office's comprehensive software, with more developments on the way, is a competitive force to be reckoned with.

The regulatory position in the U.S. is very different from the U.K.'s monopoly system, and the situation is not yet clear. It seems likely that AT&T would be permitted to do no more than act as a carrier for Viewdata signals, but there seems to be no reason why suitable consortia should not be formed using available communication network facilities. On the other hand, I would expect the competitive climate prevailing in the U.S. to erode the British lead quite rapidly. The British scene is almost dictatorial by comparison; this has enabled the state monopoly to make the investment and set standards at a rate which would be impossible in the U.S. But Texas Instruments is experimenting with a Ceefax-like system in Salt Lake City, and GTE has been working on home information systems for the last two years.

The course of future events may be substantially modified by the integration of home computers into Viewdata-like systems as was mentioned at the beginning of this paper. Included

10/2/80

in this integration would be cheap printers for page reproduction attached to the home terminal - and this immediately raises the possibility of arranging an "electronic mail" system. In fact Prestel has this facility built into it - on-screen messages of a rather elementary kind can be exchanged between viewers now, experimentally. If full keyboards were added complete messages could be exchanged.

British television equipment manufacturers are actively considering the connection of home computers to receivers. A receiver, embodying all the additional electronics, including a microprocessor, has been built to accept computer programs broadcast via Teletext. A program, stored for as long as it may be needed in the receiver's existing page storage, is executed by the microprocessor, and the TV screen is used for display. Such an arrangement would enable a viewer to run-in whatever program he needs; one idea which has been demonstrated is a "teach yourself first-aid" interactive program. At the same time the full power of access to very large information files via Prestel would be available to the viewer using the same all-purpose terminal. This is another step towards the "Consumersole" which I have described elsewhere.* Many activities, such as the purchase of goods and services and payment for them without leaving home would be possible. This brings with it a host of social problems. Amongst the less publicised of these are an acceptance of the equivocal but persuasive authority of the tube, and so the information conveyed upon it, and a further deterioration in people's capacity for good conversation and democratic controversy. Charles Ferris, chairman of the Federal Communication Commission, addressing a White House Press briefing in November said, "Lots of creative things could be done with Videodata and Teletext systems, but the consumer hasn't thought of doing them yet." I hope that the social consequences will receive at least as much attention as the technology.

*See Cawkell, The Paperless Revolution (citation in bibliography at end of paper).

14/2/80

Bibliography

Cawkell, A. E. Développements in interactive on-line systems and teletext information services in the home. On-Line Review. 1(1): 31-38; 1977.

Cawkell, A. E. The Paperless Revolution. Wireless World. 84(1511/1512): 38-42, 69-74; 1978.

Fedida, S. Viewdata - a Post Office interactive information medium for the general public. Electronics & Power. 23(6): 467-473; 1977.

Fedida, S. The Viewdata computer. Wireless World. 84(1508): 44-48; 1978.

Garfield, E. Viewdata and Scitel bring interactive information systems into the home. Current Contents. 1977(40): 5-10; 1977.

Hedger, H. Telesoftware - home computing via Teletext. Wireless World. 84(1515): 61-64; 1978.

Weizenbaum, J. Once more a computer revolution. Bull. Atomic Sci. 34(7): 12-19; 1978.

Viewdata - a review and bibliography. On-Line Review. 2(3): 217-224; 1978.

The Prestel user's guide and directory - a complete guide to information providers and services (Price £1.50). Eastern Counties Newspapers, Rouen Road, Norwich, England.